

## **Sound, Sonification**

Otakaari 1X, room A2, 2nd Floor

Session chair: **Andrea Mancianti**

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### **Nigel Helyer:**

#### **Hybrid sound-spaces**

This paper discusses elements of my creative practice that are firmly based in art&science collaboration and will focus on three major developments. These examples have been selected as they differ from the typical short term artist in residence model, each being undertaken over a period of several years. The second thread that these projects share is a core interest in sound.

The first project concerns the creation of sonic-cartographies, geo-spatially located, immersive audio interactives, undertaken by the artist as *SonicLandscapes* (with Dolby Australia) and subsequently as *AudioNomad* (with UNSW).

*Under the IceCap* is an ongoing collaboration with the Institute for Marine and Antarctic Studies (UTAS) which transforms complex bio-logging data (collected by Southern Elephant Seals diving under Antarctic ice caps) into animated 3D mapping environments accompanied by data sonification and/or live music performance from data derived graphical scores.

The final section *GeneMusik* describes a system in which music notation is transcribed into synthetic DNA, which is inserted into bacteria, mutated in vivo and finally extracted and resequenced into music - in effect creating a biological music mixing system. *GeneMusik* commenced experimentally in 2003 and has recently produced successful results at the Instituto Medicina Molecular (Lisboa).

**Keywords:** Art and Science, Art and Environment, Sound-mapping, Data Sonification, Data Visualisation, Bio-logging, Antarctic, Genetics, Micro-biology

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### **Lauren Wooley:**

#### **Self-Mapping Sound: A Composition Of Composites**

In a waveform, the aurality of sound is made visible. It provides a visual record of the ephemerality of what we hear. The idiosyncrasies of a sound – its glitches, timbre, silences – become tangible on a graph that maps amplitude over time. In this way, waveforms are mathematical functions. This artistic presentation will explore how the mathematical model of composite functions can be used as a compositional framework in sound. In part, it asks the question: what happens when sound is mapped not necessarily onto itself, but *into* itself?

One way to approach this is through the phenomenon of reverberation. When a signal from a sound source is reflected back by the boundaries of a space, the build-up and simultaneity of reflections creates reverberation. In this build-up, sound is repeatedly intersecting with itself, changing with each intersection. In math, when two functions are composed, the outputs of one become the inputs of another; one is quite literally put into the other. If we compose a function with itself, the result is often a predictable pattern of outputs. In applying this iterative process to sound, will similar patterns emerge? How does composing a sound with itself, mathematically, differ from the reflective model of reverberation? Using this process to

manipulate waveforms could create new sounds, or functions, ones which might not necessarily exist outside of this model. This will be an exploration into the interiority of sounds themselves, into what remains and what is created when a sound is mapped into itself.

**Keywords:** sound, mapping, mathematics, composite functions, reverberation

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